has a maximum at E_γ = 17.0 MeV. The integral cross section amounts to 0.31 of the total integral cross section of the reaction. The distance between the p and f levels is found to be 5 MeV.

Comparing the data on the cross section with the angular distributions of the photoprotons from zinc, measured at E = 20.8 and 23.3 MeV [2], we find that the maximum in the cross section at E = 17.0 MeV corresponds to a considerable proton anisotropy (b/a ~ 0.4), but the maximum at E = 22.0 MeV corresponds to a practically isotropic proton distribution. It is of interest to note that for photoprotons with energy $E_p \geq 5$ MeV from copper [3] two peaks were obtained in the cross section at energies E_γ = 12.5 and 16.5 MeV, in place of one braod peak in the case of zinc. In this connection, more accurate data on the cross section of photoproton emission from copper are most desirable.

The reaction $Zn^{68}(\gamma p)$ was investigated earlier [7]. The cross section at the maximum for E_γ = 22 MeV, equal to 11.7 mb, is smaller than for Zn^{67}, in accord with the previously observed decrease of the cross section of the direct photoeffect with increasing number of neutrons at a specified value of Z [8].

Thus, the reactions at low energies like the reactions (p, 2p) and (e, e'p) can be used at high energies to determine the proton binding energies in the internal shells of nuclei, provided the bombarded nuclei are appropriately chosen.

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EXCITED STATES OF THE He^4 NUCLEUS

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Excited states of the He^4 nucleus were observed by many authors [1-3]. A hypothesis has been recently advanced that alongise the well established levels with energies 19.94 (0^+) and

21.24 MeV [2] the He^4 nucleus has also levels with approximate energies 24 and 30 MeV [3]. The existing experimental data indicate that the spin and parity of the first excited level is 0^+, and that the spin of the second level is 2. There are no experimental data as yet concerning the spins and parities of the remaining levels. The foregoing raises the interesting question of the possible nature of the excited states of He^4.

We wish to point out in this note some circumstances which allow us to regard the levels of He^4 as rotational ones. As is well known, the ground state of the doubly-magic nucleus He^4 is spherically symmetrical, its spin is $J = 0$, and its parity is positive. However, it is possible that the second 0^+ level, located 20 MeV from the ground state, corresponds to a deformed state belonging to the rotational band

$$E_J = aJ(J + 1). \tag{1}$$

Using the foregoing experimental values of the excitation energy, we obtain

$$E_2 : E_4 : E_6 = 1 : 3.1 : 7.7.$$

This is in good agreement with the ratios for the rotational band of an even-even nucleus, $1 : 3.3 : 7$.

It is interesting to note that a similar situation obtains also for the O^{16} nucleus, which has a 0^+ level belonging to the rotational band in addition to the 0^+ level at 6.06 MeV.

We are not concerned with the manner in which the spherical nucleus becomes deformed as a result of the excitation. We merely point out that inasmuch as the second 0^+ level lies quite high (20 MeV), it must be regarded as most probable that the excitation is single-particle and possibly corresponds to the formation of a 3 + 1 cluster configuration. The closeness of the following levels that are observed in the He^4 nucleus offers evidence in favor of a collective nature for these levels.

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POSSIBLE EXPERIMENTAL OBSERVATION OF THE HELICITY OF THE NEUTRINO

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Zacharias [1] proposed a method for experimentally observing the helicity of the neutrino, which has hitherto remained a Gedank experiment. The method consists of observing the rotation of a macro-body covered with β-active material. In fact, under normal conditions this effect would be too small to be observable.

The American firm "Martin Orlando" has constructed gyroscopes without a single moving